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PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant	:	Michel J.F. Digonnet	Group Art Unit 2883
Appl. No.	:	10/616,693	
Filed	:	July 10, 2003	
For	:	FIBER OPTIC SENSORS WITH REDUCED NOISE	
Examiner	:	Dinh D. Chiem	

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

**Mail Stop AF**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Applicant requests a pre-appeal brief review of the legal and factual basis of the rejections in the February 9, 2006 Final Office Action. No amendments are being filed with this request, and this request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheets.

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### **REASONS FOR THE REQUESTED REVIEW**

In the February 9, 2006 Final Office Action, the Examiner rejects Claims 1, 2, 10-15 and 49-51 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,773,759 issued to Bergh et al. ("Bergh") in view of U.S. Patent No. 6,389,187 B1 issued to Greenaway et al. ("Greenaway"). In the February 9, 2006 Final Office Action, the Examiner also rejects Claims 3-9 under 35 U.S.C. § 103(a) as being unpatentable over Bergh in view of Greenaway and further in view of U.S. Patent No. 6,108,086 issued to Michal et al. ("Michal").

Independent Claim 1, from which each of the other pending claims depends, recites (emphasis added):

1. An optical sensor comprising:
  - a light source having an output that emits a first optical signal;
  - a first directional coupler comprising at least a first port, a second port and a third port, the first port optically coupled to the light source to receive the first optical signal emitted from the light source, the first port optically coupled to the second port and to the third port such that the first optical signal received by the first port is split into a second optical signal output by the second port and a third optical signal output by the third port;
  - a **hollow-core** photonic-bandgap fiber having a **hollow core** surrounded by a cladding, the hollow-core photonic-bandgap fiber optically coupled to the second port and to the third port to form an optical loop such that the second optical signal and the third optical signal counterpropagate through the hollow-core photonic-bandgap fiber and return to the third port and the second port, respectively, the cladding of the hollow-core photonic-bandgap fiber substantially confining the counterpropagating second optical signal and third optical signal within the hollow core; and
  - an optical detector located at a position in the optical sensor to receive the counterpropagating second and third optical signals after the second and third optical signals have traversed the hollow-core photonic-bandgap fiber.

Applicant submits that the combination of Bergh with Greenaway does not disclose or suggest all the limitations of Claim 1. For example, neither Bergh nor Greenaway discloses or suggests "a hollow-core photonic-bandgap fiber having a hollow core surrounded by a cladding, the hollow-core photonic-bandgap fiber optically coupled to the second port and to the third port to form an optical loop," as recited by Claim 1.

The Examiner acknowledges that Bergh does not disclose or suggest that the optical fiber loop comprises a "hollow-core photonic-bandgap fiber" as recited by Claim 1, but cites

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Greenaway for disclosing such a hollow-core photonic-bandgap fiber. In particular, in support of this assertion, the Examiner cites various portions of Greenaway that disclose that a multicore fiber may be a “photonic crystal fibre.”

Applicant submits that Greenaway, including the passage cited by the Examiner, does not disclose or suggest a “hollow-core photonic-bandgap fiber having a hollow core” as recited by Claim 1. Greenaway is silent regarding a **hollow-core** photonic-bandgap fiber having a **hollow core**.

Applicant submits that the term “photonic crystal fibre” used by Greenaway is a broad, generic term which includes species of fibers having solid cores and species of fibers having hollow cores. Therefore, the broad, generic term “photonic crystal fibre” does not inherently refer to a hollow-core photonic-bandgap fiber.

In the February 9, 2006 Final Office Action, the Examiner agrees that “the photonic crystal fiber is a generic term describing micro structured glass fibers, which **may** have a hollow core or a plurality of hollow cores” (page 4, lines 19-20; emphasis added). Furthermore, in the April 20, 2006 Advisory Action, the Examiner states that:

Applicant’s claimed limitation is a hollow core photonic bandgap fiber which is a species of the photonic-bandgap fiber genus, thus Greenway does suggests the hollow core photonic bandgap fiber which is in accordance the accepted definition for example the The Free Dictionary by Farlex of a photonic bandgap fiber may comprises of a solid of hollow core.

Because the term “photonic crystal fibre” used by Greenaway can refer to both solid-core fibers and hollow-core photonic-bandgap fibers, Applicant submits that Greenaway can not be relied upon for the disclosure of a “hollow-core photonic-bandgap fiber having a hollow core,” as recited by Claim 1. Pursuant to M.P.E.P. § 2112(IV) (Rev. 3, August 2005, page 2100-57), “[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic” (emphasis in original; citing *In re Rijckaert*, 9 F.3d 1531, 1534, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993); *In re Oelrich*, 666 F.2d 578, 581-82, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981)). The mere fact that a certain thing may result from a given set of circumstances is not sufficient. “Inherency may not be established by probabilities or possibilities.” *In re Robertson*, 169 F.3d 743, 745, 49 U.S.P.Q.2d 1949, 1950-51 (Fed. Cir. 1999). To establish inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent

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characteristic necessarily flows from the teachings of the prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)(emphasis in original). Therefore, Applicant submits that the combination of Bergh in view of Greenaway does not disclose or suggest all the limitations of Claim 1.

Furthermore, Applicant submits that the prior art does not provide a motivation to modify the disclosure of Bergh to utilize a hollow-core photonic-bandgap fiber having a hollow core. The Examiner states that Greenaway discloses that photonic bandgap fibers have characteristics (e.g., high transmission efficiency, compact size, reduced crosstalk, low sensitivity to temperature) that provide a motivation for using such fibers with the configuration disclosed by Bergh. However, Applicant submits that at column 4, lines 28-43, Greenaway actually attributes most of these characteristics to multicore fibers, not to photonic crystal fibers. At column 4, lines 44-49, Greenaway discloses that photonic crystal fibers can provide the advantages of compactness and of keeping crosstalk between the cores of a multicore fiber to an acceptable level. However, neither Bergh nor Greenaway discloses or suggests that either of these characteristics would be beneficial to the configuration disclosed by Bergh. Therefore, Applicant submits that neither Bergh nor Greenaway provides a motivation to use photonic crystal fibers in the configuration disclosed by Bergh.

For at least the foregoing reasons, Applicant submits that Claim 1 is patentably distinguished over the combination of Bergh in view of Greenaway.

Claims 2, 10-15, and 49-51

Each of Claims 2, 11, 12, 14, and 49 depends from Claim 1, Claim 10 depends from Claim 2, Claim 13 depends from Claim 12, Claim 15 depends from Claim 14, and each of Claims 50 and 51 depends from Claim 49. Therefore, each of Claims 2, 10-15, and 49-51 includes all the limitations of Claim 1 as well as other limitations of particular utility. For at least the reasons stated above with regard to Claim 1, Applicant submits that Claims 2, 10-15, and 49-51 are patentably distinguished over the combination of Bergh in view of Greenaway. Applicant respectfully requests that the Examiner withdraw the rejection of Claims 2, 10-15, and 49-51 and pass these claims to allowance.

Claims 3-9

As described above, Applicant submits that the combination of Bergh in view of Greenaway does not disclose or suggest all the limitations of Claim 1 and does not provide a

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motivation to combine Bergh and Greenaway. Applicant further submits that Michal does not disclose or suggest the limitations of Claim 1 which are not disclosed or suggested by Bergh in view of Greenaway, and that Michal does not disclose or suggest a motivation to combine Bergh, Greenaway, and Michal. Therefore, Applicant submits that Claim 1 is patentably distinguished over the combination of Bergh, Greenaway, and Michal.

Claim 3 depends from Claim 2 which depends from Claim 1. Each of Claims 4-9 depends from Claim 3. Therefore, each of Claims 3-9 includes all the limitations of Claim 1 as well as other limitations of particular utility. For at least the reasons stated above, Applicant submits that Claims 3-9 are patentably distinguished over the combination of Bergh, Greenaway, and Michal.

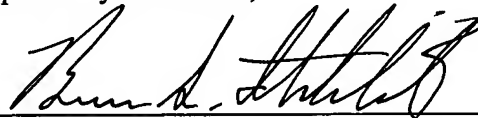
For the foregoing reasons, Applicant submits that Claims 1-15 and 49-57 are in condition for allowance, and Applicant respectfully requests such action.

Respectfully submitted,

Dated: \_\_\_\_\_

5/5/06

By: \_\_\_\_\_



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